

FOR THE
IB DIPLOMA
PROGRAMME

Theory of Knowledge

Teaching for Success

Carolyn P. Henly
John Sprague



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John: This is especially for all the teachers new to the course – there are many different reasons why teachers find themselves in front of a TOK classroom and for many it is a harrowing experience. I hope that this text helps smooth that bumpy transition. Stick to it! This will be incredibly rewarding. In terms of thanks, I'd like to acknowledge all the teachers whom I've learned from and worked for, from the long-standing TOK gurus, to my fellow curriculum developers and those of you brand new to teaching the course (including you, Anita!). I hope that this text can stand tall alongside the insight and support you've given me.

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Introduction

Teaching Theory of Knowledge

This book has been designed as a companion to the student book *Theory of Knowledge for the IB Diploma Programme 4th Edition*, by Carolyn P. Henly and John Sprague, published by Hodder Education. This introductory chapter has been written particularly with the inexperienced Theory of Knowledge (TOK) teacher in mind, and discusses the ways in which teaching TOK is different from teaching other high school subjects, as well as how to approach organizing and running an effective TOK course. Chapters 1 to 12 are aligned with the student book chapters and will suggest strategies for teaching the 2020 curriculum. They also contain sample lesson plans. The final chapter of this book gives advice on how to prepare students for the two TOK assessments. That topic is not covered in the student book, however, students can, if they wish, get extra help from *Theory of Knowledge for the IB Diploma: Skills for Success 2nd edition*, by John Sprague, also published by Hodder Education.

Part 1: The unique nature of Theory of Knowledge

Theory of Knowledge is a course about how knowledge is developed, tested, verified and updated when necessary. It is about the obstacles to making knowledge and how we overcome them. You will be helping students investigate these processes in five areas of knowledge (AOKs), all of which should be familiar to your students, as they are taken from the subjects that students study as part of their regular schooling as well as in the IB Diploma Programme:

- Mathematics
- The Natural Sciences
- The Human Sciences
- History
- The Arts

In the study of those areas, you will consider how professional knowledge-makers go about their work, considering such things as how the processes that they undertake can lead us to be able to trust the knowledge that they share with the rest of society.

You will also be exploring a core theme, 'Knowledge and the Knower', which offers students the opportunity to consider how individuals, including themselves, acquire knowledge, and how understanding our own individual knowledge-making processes can equip us to better understand other people's perspectives.

And finally, you will be investigating the means by which knowledge is developed, tested and revised, in the context of some other knowledge-related topics that are addressed in the optional themes:

- Knowledge and Technology
- Knowledge and Language
- Knowledge and Indigenous Societies
- Knowledge and Religion
- Knowledge and Politics.

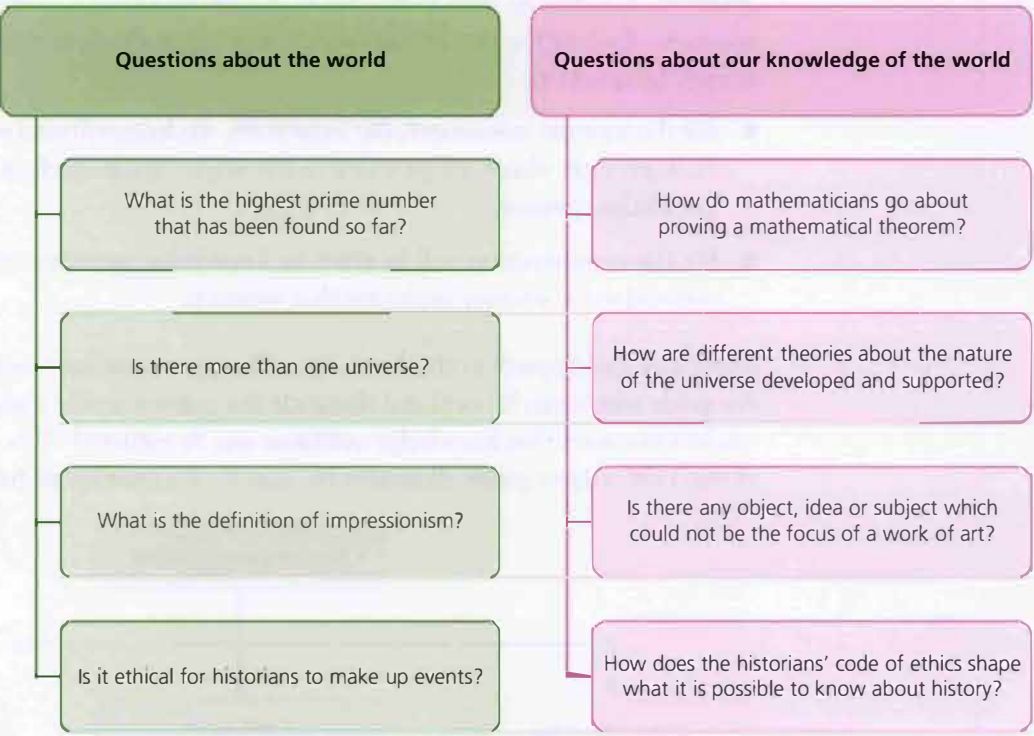
You are required to include at least two of those five themes in your course. An important concept to consider, while investigating all the themes and the areas of knowledge, is the idea of communities of knowers. Much of our knowledge in all these areas is developed, justified, tested and accepted or rejected by communities, rather than by individuals.

Throughout the course, you will be considering questions about the problems we face when we try to make knowledge – both as individuals and as groups functioning in the formal pursuit of new knowledge – and you will be considering questions about how we overcome those obstacles.

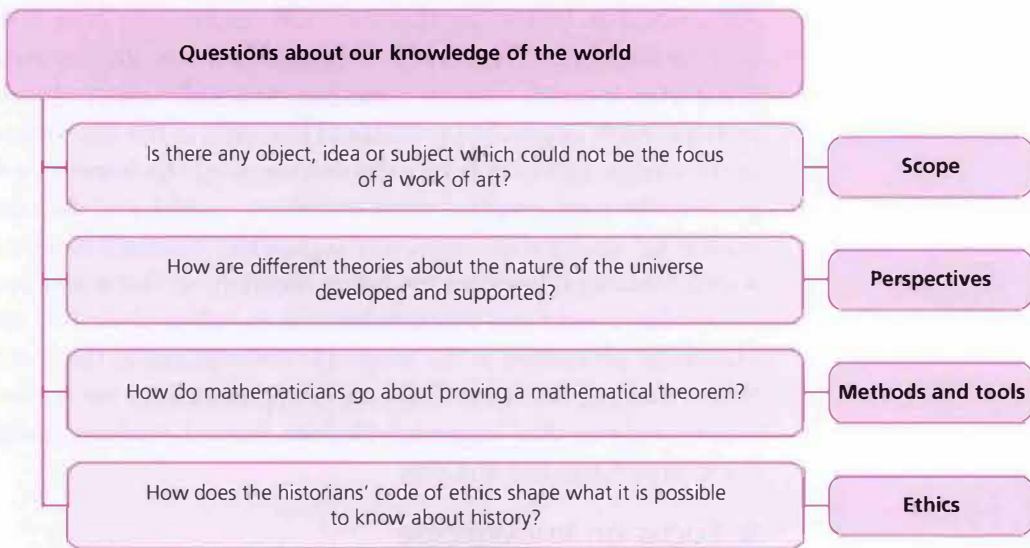
The critical understanding that any TOK teacher must have is that the TOK course is about *knowledge*. The content is essentially metacognitive: students are learning about what it means to know something in a wide variety of contexts. That sounds perhaps overly simple, but it is easy to lose sight of the knowledge generation aspect of the course, and to slide into discussions about the features of the real world. This is possibly the most tempting when it comes to considering the relationship of ethics to knowledge: students are often very engaged by questions of what is right and what is wrong behaviour; however, the ethics questions in this course have to focus on how we know what is right and wrong behaviour, as well as about how ethical concerns shape knowledge generation in the areas of knowledge and in the core and optional themes. When studying history in TOK, for example, students are not studying the events of history and why they happened; they are, instead, studying questions about how we know what happened and why.

■ Focus on knowledge

One way to think about the fact that TOK is about knowledge, rather than real-world events, is that in TOK we ask questions about what we know about the world and analyse the means by which we know what we know. This distinction is also covered, but for a student audience, in *Theory of Knowledge for the IB Diploma Programme: Skills for Success 2nd edition* by John Sprague, also published by Hodder Education.



If you examine the questions in the graphic on the previous page, you can see that the questions in the first column are all questions to which there is a right or wrong answer, and the answer would be constructed by *using* a particular discipline. In the case of the question about the potential for more than one universe, there is a right answer, one established through the application of physics, although it has not yet been established with a high degree of certainty. The questions in the second column all require much more complex answers and aim to unpack a different sort of *content*. Different answers could be offered but would have to be justified with evidence and logical argument. The questions in the second column also use TOK terminology and relate to the framework, as shown below:

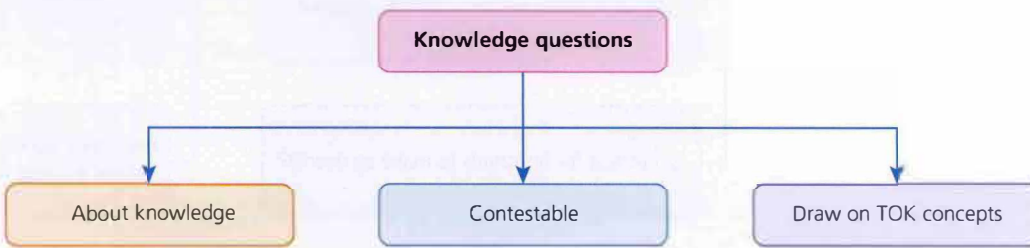


■ Knowledge questions (KQs)

All of the questions above are examples of ‘knowledge questions’. A knowledge question is a question about our knowledge of the world. At the heart of the TOK course is the exploration of knowledge questions. Students do not have to be able to write knowledge questions, but they do need to be able to provide thoughtful answers to knowledge questions. Each of the two IB assessments requires students to explore and respond to knowledge questions.

- For the internal assessment, the exhibition, students will choose one of the 35 TOK prompts which are provided in the subject guide. Each of those prompts is a knowledge question.
- For the essay, students will be given six knowledge questions. Students will then choose one and write an essay exploring that question.

In each of the chapters in this book, we will suggest some knowledge questions from the guide which can be explored alongside the content in the student book, and we will model some ways that knowledge questions can be explored. This diagram, from page 11 of the TOK subject guide, illustrates the nature of a knowledge question:



By ‘about knowledge’, we mean that the question must be about how we develop, test, and revise our knowledge of the world. Probably the largest stumbling block to effective TOK discussions and analyses is that students and their teachers very easily get caught up in questions and discussions which are drawn directly out of a discipline. TOK questions are about the nature and construction of knowledge, not about the facts of the world.

Contestable questions are those for which there is some debate. Some questions about the real world are also often very debatable, so this criterion doesn’t distinguish KQs from discipline questions, but is included to emphasize at least two things. First, they are generally better when they are ‘open’ questions (‘Does the media influence our political beliefs?’ is not as good as ‘In what ways does the media influence our political beliefs?’), or if they are closed questions, it is better if they clearly are aimed at investigating a tension or dilemma in the construction of knowledge. ‘Should psychology be considered a science?’ is a closed question, but clearly is scratching at a controversy.

Second, the best knowledge questions are those which move beyond describing TOK elements and consider the significance of those elements. While, ‘In what ways does the media influence our political beliefs?’ is a genuine knowledge question, it is not very controversial. We already know the media does influence political beliefs! A student would be doing reasonably good TOK by uncovering the influence of the media and describing it, but the better student would be accessing even more sophisticated thinking skills by investigating the significance of that influence. Therefore, a genuinely contestable knowledge question might be something like, ‘Has the influence of the media made it impossible to have a political system based on facts?’ or perhaps, ‘In what ways has the media made propaganda the norm in political discourse?’

Finally, good knowledge questions will often (but not always) draw directly on ‘TOK concepts’. These concepts are not patented terms that will only be found in the specification – the IB doesn’t have a monopoly on terms related to the critical analysis of knowledge – but there are a ‘family’ of terms that the course emphasizes. Twelve of those concepts are highlighted in the specification and in the student book:

- | | | |
|---------------|------------------|------------------|
| ■ Certainty | ■ Interpretation | ■ Power |
| ■ Culture | ■ Justification | ■ Responsibility |
| ■ Evidence | ■ Objectivity | ■ Truth |
| ■ Explanation | ■ Perspective | ■ Values |

Other terms that might show up in a well-formulated knowledge question could be references to the areas of knowledge, the optional themes or the cognitive tools which are some of the sources and influences on knowledge. These were previously called ‘ways of knowing’ and included reason, emotion, sense perception, language, memory, intuition, imagination and faith.

TEACHING TIP

Throughout the TOK subject guide, you are presented with knowledge questions, several for each element of the framework for every theme and area of knowledge, as well as the 35 TOK prompts for the exhibition. The prescribed titles for the TOK essay will be formulated as knowledge questions. We do not, therefore, suggest that you spend too much time worrying about how to formulate them; your focus should be on guiding the students to develop responses to them. If, however, ensure you feel that you would like to write some knowledge questions of your own, or if you feel that you have a need for a question on a particular topic which is not covered by any of the knowledge questions in the guide, then you are, of course, free to write your own and then use it in the context of your teaching. If and when you do, however, ensure your questions fulfil all three requirements: they are about knowledge, they are contestable (that is, there is some tension where multiple answers could be possible) and they draw on TOK concepts.

We have included many of the framework knowledge questions from the TOK subject guide at appropriate points in the chapters in this book. We have included the same questions in the student book; however, we do not wish to imply that students could read and answer knowledge questions on their own. Students must be encouraged to understand that there are no simple answers to knowledge questions, and that their understanding of the answer to any given question will develop and grow as they progress through the course and develop an understanding of how the implications of each question varies across different knowledge-generating contexts. We have also included TOK prompts in the student book at various places to encourage students to connect the ideas in the book to the internal assessment. The decision, however, as to which knowledge questions you wish to have your students pursue and when is, of course, entirely yours, so you should feel free to use our suggestions only when they are useful, and to substitute other questions if they suit your programme better.

You are not obligated to formulate knowledge questions or to teach students how to, although understanding what a 'knowledge question' is, will certainly help students (and teachers) develop good analytical responses. A knowledge question is designed to promote good TOK thinking. If you decide you wish to help students learn to develop their own knowledge questions, then it would be a good idea to ensure that you tie that activity to the learning of some particular element of the syllabus. Students will not be assessed based on any ability to develop a knowledge question of their own, so that activity is not a necessary part of the course.

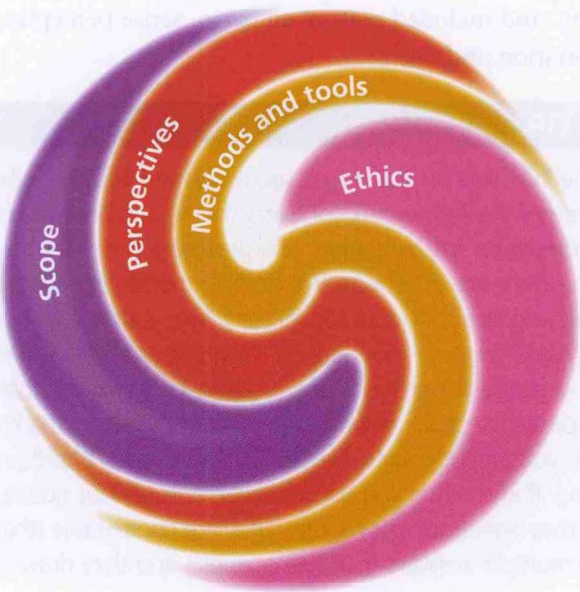
■ The knowledge framework

In an attempt to give students and their teachers the best opportunity to maintain close to genuine TOK thinking, the course is structured around a 'knowledge framework'. Teachers who are used to the old specification will recognize this framework in the pared down version in this iteration of the course. The idea is that the framework provides an opportunity for the learners and teachers to clearly frame the comparisons across the core theme, the optional themes and various AOKs.

There are four elements of the knowledge framework:

- Scope
- Perspectives
- Methods and tools
- Ethics.

Each element is meant to provide a series of ideas and approaches that the TOK student and teacher can apply to the type of knowledge under consideration.



■ Scope

When reflecting on the ‘scope’ of a theme or AOK, we are encouraging students to think about the nature of the theme or AOK and how it is different in intent from other AOKs. The focus is on what the point of the AOK is, when you might need to apply it and what it is designed to do (and not do). In Chapter 6, when we explore the relationship between the natural sciences and religious knowledge systems and how they might offer different types of explanations, we are thinking about where the scope of the two types of knowledge intersect. When we explore the role that a unique cultural knowledge system plays in maintaining an Indigenous identity in Chapter 5, we are exploring the scope of knowledge. Examining the scope of an AOK or theme can become quite conceptual, and sometimes these are the most challenging questions and the hardest to come to concrete conclusions about. ‘What is the function of history?’ for example, can be a bit unwieldy in the context of a discussion with TOK students. Even though, however, this might require a lot of conceptual analysis, teachers should always make attempts to link the discussion to what people actually do in relation to knowledge. For instance, in Chapter 11, when considering why having a shared history is important to a culture or a particular community, we use direct examples of history being used in this way (Singapore’s National Day celebration and Reni Eddo-Lodge’s book *Why I’m No Longer Talking to White People About Race*). In that chapter, we discuss them in the context of the role of ethics in history, but they illustrate the scope of history, as well.

The following questions are from the TOK subject guide (page 12):

- What motivates the pursuit of knowledge in these themes/areas of knowledge?
- What practical problems can be solved through the application of knowledge from these themes/areas of knowledge?
- What are the key current open/unanswered questions in these themes/areas of knowledge?
- What makes this theme/area of knowledge important?

■ Perspectives

Within various communities of knowers we will find a number of *perspectives*. Considering perspectives helps students think about the *choices* that experts in various communities of knowledge make when constructing knowledge. Chapter 10: The Human Sciences, for example, explores various established perspectives within the fields of economics and psychology. Other examples might include ‘schools of thought’ within disciplines. One might also consider different AOKs, or disciplines within the AOKs, as perspectives: in order to ‘explain’ some world event (the various protests in Hong Kong in 2019, for instance) you might apply an economic perspective, an historical perspective or a political perspective. None are necessarily the *obvious* route to choose but exploring different perspectives might provide different insights.

Another helpful way to think about the different perspectives involved in the knowledge provided by an AOK or theme is to break it up into considerations about three aspects of it:

- the **creation** of the knowledge (usually by ‘experts’)
- the **critique** of that knowledge
- the **consumption** of that knowledge.

In each of the AOKs, for example, we might consider *how the body of knowledge* was created, we might think about how we might *critique* it as ‘reliable’, or we might explore it in terms of how that knowledge is *consumed*, either by other experts in the field or non-experts hoping to learn more about the topic.



Perspectives on knowledge from the:

- **Creator:** what must experts in the field do to make their knowledge? What are they hoping to achieve?
- **Critic:** how do people *judge* that knowledge as 'reliable' or what makes an individual more or less reliable when making such a judgment?
- **Consumer:** how do people appropriate the knowledge? How important is specialist knowledge for non-experts in order to understand knowledge created by experts?

You will notice of course that there is already a lot of overlap between perspectives and scope, and also between the perspectives of the creator, critic and consumer. This is acceptable and expected. Unpacking those overlaps is often the core of a successful TOK analysis!

The following questions are from the TOK subject guide (page 13):

- What is the significance of key historical developments within these themes/areas of knowledge?
- What do these themes/areas of knowledge identify about knowledge that is rooted in particular social and cultural groups?
- Are some types of knowledge less open to interpretation than others?
- Is an understanding of the perspective of other knowers essential in the pursuit of knowledge?

■ Methods and tools

Much of the discussion of the AOKs will naturally focus on the methods and tools experts use when constructing knowledge about the world. This element of the knowledge framework focuses the discussion on the conventions, rules and methods of the construction of knowledge, and includes both the physical tools (eg, microscopes) and the theoretical tools or frameworks (eg, the 'scientific method' or the 'historical method' or 'experiment' or 'observation') of an AOK. Discussions of reliability, bias, certainty or propaganda will be closely tied to the methods used in the construction of knowledge. Thinking about how, for instance, technology or social media has influenced political discussion or an individual's construction of their own political beliefs can be cast in terms of methods.

The following questions are from the TOK subject guide (page 13):

- What assumptions underlie the methods of inquiry used in these themes/areas of knowledge?
- Does what is seen to constitute 'good evidence' vary from discipline to discipline and culture to culture?
- How is knowledge produced and communicated in these themes/areas of knowledge?
- How important are material tools in the production and acquisition of knowledge?

■ Ethics

In previous TOK specifications, ethics was its own AOK, but in this course, it has become part of the knowledge framework. One reason for this is that students and teachers cannot really avoid discussion of the ethical implications of knowledge. It also helps ground ethical discussions in the real-life practical discussion of how knowledge is constructed and consumed in the world, rather than overly conceptual discussions of ethical dilemmas.

It is very important to remember that students must maintain a clear focus on knowledge when exploring ethical questions. They will naturally get caught up in the attempts to solve ethical dilemmas and may forget to consider how the ethical principles were developed in the first place – how do we know what is ethical and what is not? Embedding ethics into the framework will help students consider the construction of knowledge in terms of its consequences for knowers: does it confer responsibility on the knower? Does it create unfair advantages or disadvantages depending on who has it or who controls it? Censorship is a hugely popular TOK subject with students and could be explored in relation to the ethical implications of disseminating knowledge.

The following questions are from the TOK subject guide (page 13):

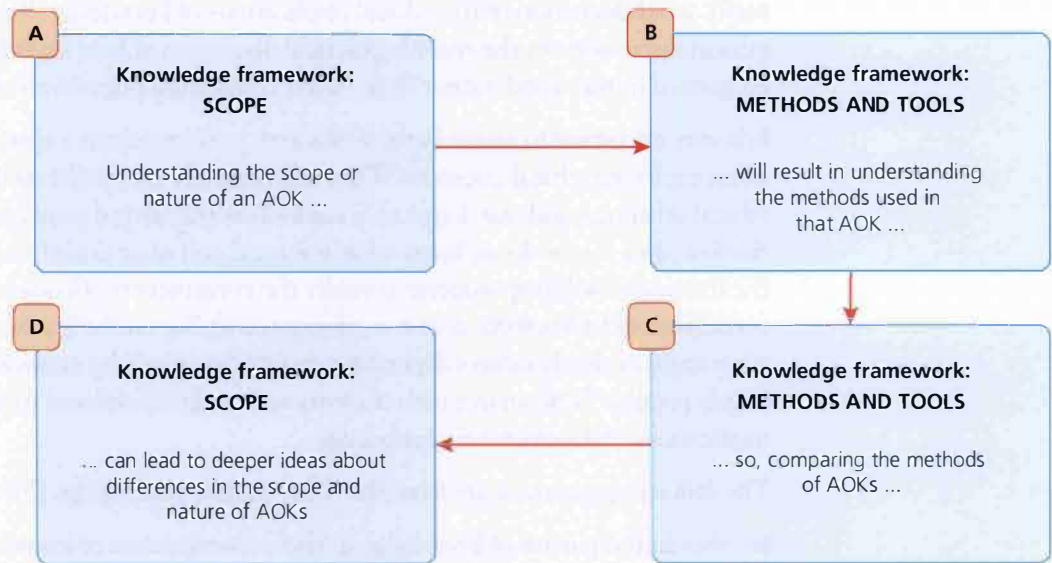
- Should the pursuit of knowledge in these themes/areas of knowledge be subject to ethical constraints?
- What responsibilities rest on the knower as a result of their knowledge in these themes/areas of knowledge?
- How can we know when we should act on what we know?
- Do established values change in the face of new knowledge?

■ TOK TRAP

When presented with a 'framework' in a specification, it is easy on the one hand, to see the various elements as being unquestionable or sacrosanct, and on the other, to see the different elements as entirely distinct. This is not the case with the knowledge framework. It is better to see the elements as loose categories of questions, ideas and approaches, rather than identifying them as rigorous or non-negotiable boundaries. They provide opportunities for discussions and analyses rather than anything that needs to be memorized, so don't feel a deep sense of rigid obligation to these ideas.

Teachers should think carefully about how they develop their learning activities in relation to the elements of the framework – we don't want students to think there are no overlapping questions or relationships between the elements. A discussion of one of the elements will more likely than not draw on other elements. Consider, for example, the relationship between the scope of a subject and its methods involved in the construction of knowledge. It is very likely that the nature of the subject will be the explanation of why certain methods are appropriate and others are not. The nature of the sciences, for instance, means that they are an attempt to understand and explain the observable features of the world around us (see Box A in the diagram shown on page 12). The methods to do that could never be entirely focused on concepts and ideas – we would need to get into the world and see what is there. This means that the 'scientific method' requires observation and experimentation in the real world (see Box B in the diagram shown on page 12). Conversely, considering which methods are generally enacted by experts in the field helps us understand the nature of the subject. The use of axioms, deduction and logical inference in mathematics (see Box C in the diagram shown on page 12) help us understand the inherently conceptual nature of the

subject (see Box D in the diagram below). It also, however, gives us an opportunity to explore the seeming contradiction of why, if mathematics is so conceptual, does it seem to so well describe physical phenomenon in the world.



THE SHORT VERSION

Making connections across the knowledge framework

Use the various elements of the knowledge framework to make points about other elements of the knowledge framework.

Use explorations of one AOK to make points about other AOKs.

For teachers, being able to identify and use these similarities and differences across elements of the knowledge framework and across AOKs takes some time to develop. Don't give up.

■ The nature of an effective TOK lesson

The fact that knowledge and questions about knowledge define the TOK course does not mean, however, that TOK is not concerned with the real world. The exploration of knowledge must be grounded in the real world. Students will use examples from the real world for both of their assessments. Although you might sometimes begin with an abstract knowledge question (which is where the TOK essay begins), often you will find it to be very effective to begin the exploration of that knowledge question with an investigation of a real-world situation, from which students can extrapolate the knowledge issues. You will find a number of examples of this kind of lesson idea in the chapters which follow, but just by way of demonstration, here is one example:



Begin by showing students a short clip from British comedian Stephen Fry's BBC show *QI*, which can be accessed using the QR code in the margin.

The clip shows a strange optical illusion and makes the point that we cannot NOT see the illusion, even if we try. Ask students to notice what is happening and see if they can come up with an explanation of why it happens. To support this discussion, students could read Chapter 4 of Daniel Gilbert's *Stumbling on Happiness*. The chapter is called 'In the Blind Spot of the Mind's Eye', and you may wish to have students begin at the section called 'Filling in Perception'. A very important part of this lesson is that students must then take what they learn about how and why the brain generates optical illusions from various phenomena and apply it to one or more knowledge-making

contexts. It is not sufficient for the aims of TOK for students to be able to say that one limitation of our perception is that we are prone to optical illusions, some of which we cannot visually overcome. They must be able to discuss how that fact affects our ability to make knowledge. Does the fact that we can be fooled by optical illusions affect our knowledge of science? History? Politics? The arts? At this point, students are exploring a knowledge question, but we got there by starting with quite a simple real-world situation.

TEACHING TIP

It is easy to fall into very interesting, creative and productive discussion in TOK about all manner of things. However, teachers must take care to stay alert for when the conversations shift away from TOK thinking or analysis and into discussions about phenomena in the real-world which don't contribute to students' understanding about how knowledge is generated, tested, or revised. One of the reasons for removing the emphasis on the 'ways of knowing' (WOK) as stand-alone entities in the current guide was that students were getting rather too caught up in talking about the WOKs, rather than making the point about them and then relating that point to the construction of knowledge in the context of an AOK. In the new course, the term 'ways of knowing' has been eliminated. The kinds of methods that individuals use to make knowledge are now best called something like 'cognitive tools'. Cognitive tools are a fantastic way to explore the means by which our understanding of the world is shaped and influenced, but don't let the students stop at a description of those cognitive tools – coax them into applying those ideas to AOKs.

That last step in the lesson described on the previous page is the crucial one which makes it a TOK lesson, rather than a content lesson in, say psychology or art. You can see in the video clip of the optical illusion how engaging it is – the guests on the show react with surprise and excitement. We can expect that students will, too. Many of the real-world situations that you introduce into class will be equally engaging. Students can become very involved in a discussion, say, of whether and how to provide health care services to immigrants, or whether it was ethical for Marco Evaristti to create an artwork out of putting goldfish in blenders which audience members could, if they chose, turn on (you can read more about Evaristti's artwork by using the QR code on the left).



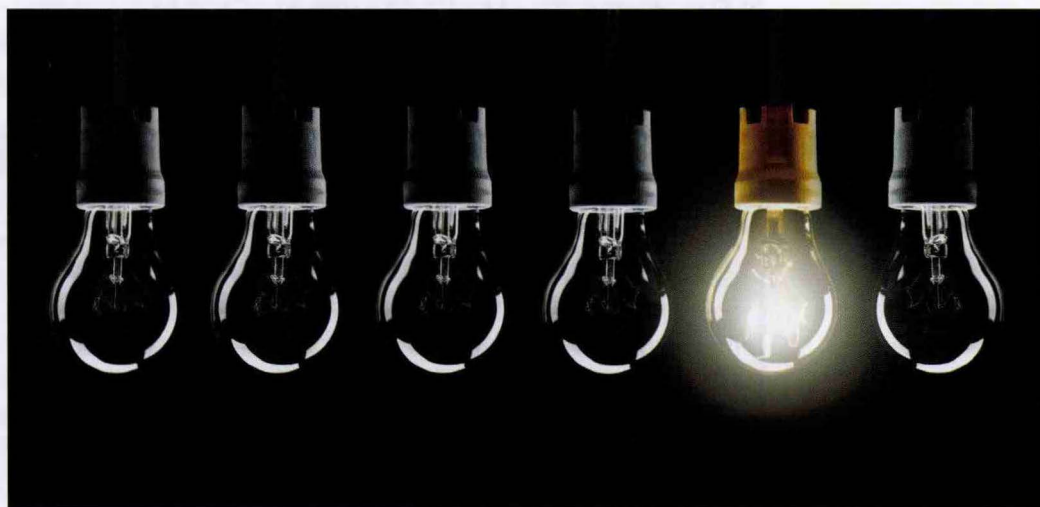
It can be easy to mistake the excitement that comes from an impassioned debate for engagement in TOK learning. However, the goal of TOK is the investigation of the ways that we generate knowledge, so the health care discussion must turn to how knowledge is made in politics, or possibly history or economics (or all three) and the goldfish discussion must move on to a consideration of how ethical concerns do or do not constrain artists and why, in terms of the aims of the arts. Notice that this consideration moves the discussion from the specific to the general, and that is always where we want to go. Ultimately, we want students to be able to offer insightful observations about how different aspects of the framework function in the area of knowledge or the theme in general. Sometimes, a single generalization cannot be made, because the mechanism is contingent on some context. In such a case, students who can explain how different contexts result in different generalizations are demonstrating a truly sophisticated TOK skill!

THE SHORT VERSION

How to explain TOK to parents or other interested people

TOK is a class in which students learn how knowledge is developed, tested, validated and, when necessary, revised. It prepares students to be able to judge for themselves whether the claims they are presented with are sound or whether they are incorrect or even deliberately misleading.

Part 2: How TOK differs from other academic subjects



As we have seen, one important way in which TOK differs from other academic subjects is that TOK focuses on questions of how knowledge is made in all the other academic subjects – and in other contexts – rather than on the content of those subject areas. Another significant difference, and one that students often struggle with, is that TOK requires students to delve into the reasons that we might not know ‘the right answer’, and why ‘the right answer’ may, in fact, be unknowable – at least at the present time with the present technologies available to us.

Knowledge and learning in the context of schools is often a somewhat artificial process because so much of what students do is amass a body of knowledge developed by others long ago. Students, therefore, have a lot of experience with being told what is true and what is not, and very little experience of grappling with any nuances or questions about whether or not what they have been told is true really is, or how certain we are about it or how we came to establish that truth. Many students, by the first year of the IB Diploma Programme, have learned to accept what they are told without questioning it. Many students have come to believe that if they don’t know or understand something, that failure is due to something about them and their lack of ability, rather than due to any complexity in the knowledge-making process itself. Many IB students, because they care a great deal about their marks and what those marks mean in terms of college admission and scholarship awards, are particularly keen to know ‘the right answer’ so that they can give it back on tests.

Being faced with a course in which they are not told the answers to learn and remember for the test can, therefore, be quite a difficult experience for some students – especially in the first year of the Diploma Programme – and especially because you are showing them that this is a reality of the real world, the world that they will have to cope with as adults once they are done with their schooling. Students, who have spent much of their lives functioning inside an institution which seems to imply that adults have all the answers and that students need only get those answers from the adults and then remember them for themselves, can find it difficult to accept that adults do not have all the answers and that they, themselves, may one day be charged with finding answers that humanity does not have right now. You may find yourself having to deal with the consequences of a kind of culture shock as the students adjust to a class which requires a whole new kind of thinking. Many students find TOK a challenge, even though they are doing extraordinarily well in other subjects. TOK is quite a different sort of thing and the transition is often difficult. When students find themselves uncomfortable in TOK, it might be a sign that it is working.

We should not underestimate the challenge the course presents to the *teachers* trying to make sense of it in the classroom either. Many teachers have come to TOK through no desire of their own, sometimes because their course load is light, or because someone higher up thinks of them as ‘a TOK kind of teacher’. Whatever the case, stepping out of the comfortable confines of subject teaching and into a TOK course is a genuine challenge. So while students may find this shift into the messy world of knowledge difficult, there is no doubt that teachers will also find it so. This grey area of undefined answers is an uncomfortable space to be in, but it does get better with experience.

TEACHING TIP

Remember that, ‘I don’t know, good question’ is a perfectly suitable response to a student’s question. It takes bravery to admit to a class full of students that you’ve never thought about that before, or that you have, but you haven’t yet developed a response. But this is exactly the sort of experience your students are also having. This is an excellent opportunity to model good TOK learning. Try, ‘I don’t know, good question. How could we go about developing an answer using what we have unpacked in the course so far?’ and then follow along the student’s journey. In our experience, the more of these interactions there are, the better it is for us as TOK teachers.

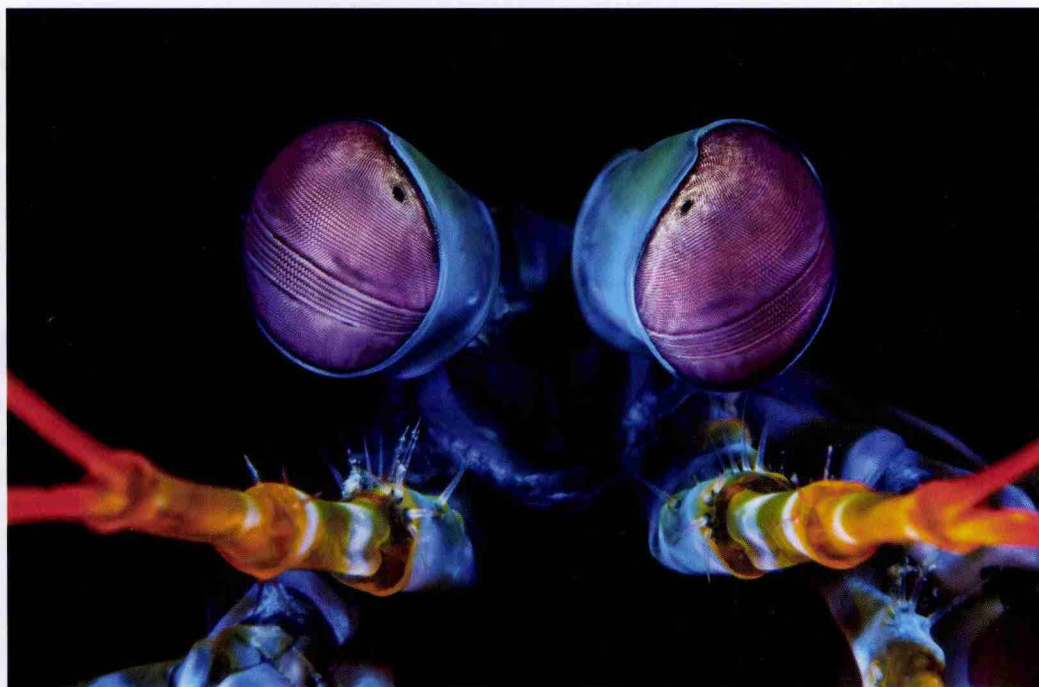
■ Theory of Knowledge should promote a healthy scepticism towards knowledge

Central to the course is the general worry that what we think we know about the world might not be entirely right. TOK investigates the fact that different subjects of AOKs describe the same world in different ways, and that the methodologies involved often are prone to error in a number of ways. This means that one aim of TOK is to promote a general scepticism towards what we claim to know. We want our TOK students to take knowledge with a grain of salt, but this doesn’t mean we want them to deny that knowledge is possible. This is both irresponsible and incorrect. We do gain knowledge about the world, and we have pretty well-established rules when that knowledge is well grounded. We don’t want our students to leave our class thinking ‘we can’t know anything’.

Here we introduce two ‘levels’ of scepticism: scepticism on the part of the individual and scepticism on a global or philosophical level. The ideas in both of these sections make for good TOK, but students should contextualize these discussions by applying them to how experts in the AOKs manage these worries or to their effect on the AOK, rather than simply settling into an overly philosophically sceptical position.

■ Limitations of our individual cognitive tools

At the individual level, we might say that we gain knowledge through a variety of psychological or cognitive features of human beings, which, we know, can get it wrong. For one example, we might consider the relatively limited ability of humans to perceive the world through the five senses. We can understand the problem of the limitations of our senses and, consequently, of our ability to perceive the world through them, by considering the fact that many animals have sensory capacities which are vastly different from ours. Bats, famously, have quite limited eyesight but can navigate the world in darkness because they use something like our sonar. This gives them a picture of the world which consists of sounds bouncing back to them off the surface of objects. It is almost impossible for sighted humans to imagine what this ‘vision’ of the world is like (though some blind people have learned to use echolocation themselves and they can, presumably, understand the bats-ear



A mantis shrimp

view of the world!). Bees and butterflies see in the ultraviolet spectrum, while some species of snakes see in the infrared spectrum ('What colors do animals see?'). Mantis shrimp have many more cones in their eyes and so can '... detect circularly polarized light, which is what happens when the wave component of light rotates in a circular motion. They also can perceive depth with one eye and move each eye independently. It's impossible to imagine what mantis shrimp see, but incredible to think about' (Franklin). Our inability to perceive the world the way these creatures do illustrates the problem of how our perception limits what we can know. If we cannot see the world in the way a mantis shrimp does, for example, then what might there be out there that a mantis shrimp, if it could be a scientist, would know to investigate, but which *we* don't even know is there? If the study of the physical properties of the universe is dependent on our ability to perceive what is actually there, and if, as we have seen, there are many situations in which we cannot observe some aspect of the universe at all, we are confronted with questions about *our* ability to provide a full description of what's out there.

Individuals make knowledge using their sense perception, reason, emotion, language, imagination, intuition, memory and faith (among other things). You might think of other personal tools for making knowledge which are relevant and important to bring up. There is no requirement in the 2020 curriculum for teaching specific sources of knowing, however, you will find that these different ways of knowing are relevant in various places in the course under the heading of Methods and tools. These personal ways of knowing are particularly relevant to the core theme, which specifically requires investigation into the ways that individuals make knowledge. However, you will also find that it is sometimes helpful to consider the kinds of cognitive tools that help – or hinder – the creation or discovery of knowledge in some of the themes and areas of knowledge. Emotion, for example, can be a strength in trying to make accurate knowledge about politics, because our political beliefs tend to be founded on deeply felt values. It can also act as a barrier to political knowledge, however, because if we are too driven by our emotions, we can be led into all kinds of errors such as cognitive bias or refusal to accept facts. In the arts, emotion is one of the primary means of making knowledge; much art is intended mainly or solely to trigger an emotional response. The natural sciences are fundamentally observational, so sight, hearing and sometimes taste or touch are important means of collecting data.

Reason is essential to the making of knowledge in mathematics, and so on. In each case, however, TOK students must shift from the discussion of how our cognitive tools might be unreliable, to a discussion of what this means for experts in the various disciplines trying to construct knowledge.

Some important points for you to consider when asking students to investigate the role of these personal tools for making knowledge in knowledge development are outlined below.

- These cognitive tools never operate in isolation. Sometimes students like to have things nice and compartmentalized and so will try to claim things like: 'Mathematics uses reason' (as if no other kind of mental process is ever relevant) or 'History only uses memory'. The various cognitive tools are used in clusters and simultaneously. It is difficult, for example, to separate the experienced mathematician's reasoning from their language (reading or speaking), imagining, remembering and intuiting. The historian must use sight, language, reason, memory, imagination and so on.
- It is not always necessary to discuss the role of these cognitive tools. If a particular example relies heavily on, or reveals the use of, the various tools that individuals use to make knowledge in a significant way, then it is appropriate to discuss them. Otherwise, there is no requirement to do so.
- It is as important to recognize the value of the cognitive toolkit as it is to recognize the limitations.

■ Fundamental limitations on our ability to know

Beyond the concerns about the role that our cognitive tools might have on an individual human's ability to construct knowledge (and the aggregate effects of that for a community of knowers), there are deeper issues at work that may lead to a profound scepticism which runs the risk of scuppering the project of constructing knowledge altogether.

Students are, of course, to some degree, already accustomed to the idea that in some situations multiple answers are possible. The interpretation of a work of art, for example, depends a great deal on the knowledge and experience of the person who is doing the interpretation. If I am reading WD Snodgrass' poem 'Returned to Frisco, 1946' (see page 417 of the student book), which has a narrator who is a soldier in the Second World War, and I am *not* from San Francisco, I might reasonably interpret the title of the poem as meaning that the speaker of the poem is from San Francisco and has been sent home from wherever he was posted abroad. If, however, I am a reader who *is* from San Francisco, and I know that locally 'Frisco' is considered to be an insulting way to refer to San Francisco, then I would reasonably interpret the title as meaning that the speaker of the poem is *not* native to San Francisco, but is being sent from one foreign environment to another, and I might see the 'returned' as being ironic. If I am a reader from Frisco, Texas, then I might consider that the speaker is from *my* hometown – at least until I get to the references to the coastline and bay, since Frisco, Texas, is a land-locked town. Any of these readings of the title constitutes a reasonable interpretation of the words on the page.

Even in such a situation, however, some students will be inclined to want to know which one is the 'right' interpretation, and, so long as they can learn a viable interpretation, even the most dogmatic of the students will be happy. Importantly, too, the interpretation of a work of art isn't a kind of knowledge on which we rely for our day-to-day survival. Getting something approximating the 'right' answer in some questions can be rather more important.

Consider the difference between this situation, however, and one in which the knowledge in question is the kind of knowledge which does make our everyday lives possible.

We are accustomed to thinking of knowledge which is generated by natural scientists as being highly reliable. It allows us to predict how things will work in the future. It has been responsible for a great many of the developments which allow us to live lives which are assisted by an enormous range of technologies, including medical technologies that prolong life itself. Yet scientists themselves know that science cannot solve all problems and that it may not be possible for science to answer some of the greatest questions that we might like it to answer: questions about consciousness or about the beginning of the universe, for instance. In April 2019, a two-day meeting was held at the Institute for Cross-Disciplinary Engagement at Dartmouth, in New Hampshire in the United States, during which scientists and philosophers explored this problem. The meeting was called 'The Blind Spot: Experience, Science, and the Search for "Truth"' ('Public Dialogues and Workshops'). During that workshop, participants discussed questions about what knowledge natural scientists are capable of developing and whether there are some questions about physical reality which science simply cannot answer (Falk). (Interestingly, exploring the 'limits' of practitioners of disciplines (what they can and cannot 'know') makes for good TOK!)

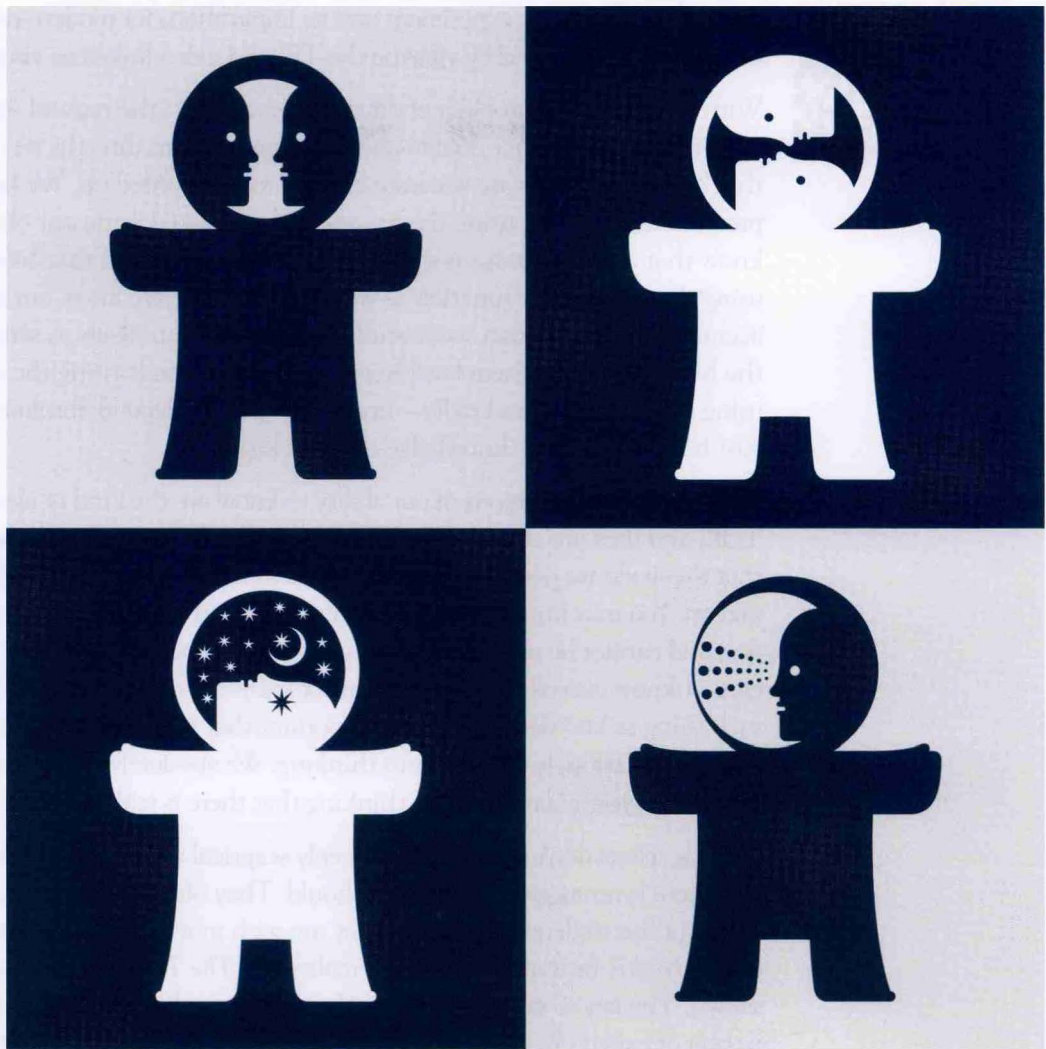
The root of the problem is a classic one which goes back to philosopher René Descartes, who realized that we cannot get outside of our own experience of the world to determine objectively whether what we experience is accurate or not. He argued that we do not have independent access to the world, so we cannot know whether or not what we think about the world is just a *constructed* reality. This resulted in his famous statement, 'I think, therefore I am', which was the first claim that Descartes could make with certainty, given that restriction of viewing the world from inside his own head. However, 'Thought is occurring to me' doesn't lead to much.

Scientists today are still grappling with that problem. According to Dan Falk, who was present at the Dartmouth conference, scientists '... admit there is a certain kind of science that works incredibly well, when a little portion of the universe is cordoned off for study, with the scientist positioned outside of the carefully defined region under investigation.' Quite a bit of science works just this way: scientists observe processes of which they are not a part. Results over hundreds of years have shown us that the scientific methods for this kind of discovery work very well. (The student book goes into these methods in some detail in Chapter 9.)

The problem arises, however, when it comes to questions that involve aspects of the physical nature of the universe which touch directly on our ability to perceive and understand things – the nature, in other words, of our consciousness. The organizer of the conference, Marcelo Gleiser, co-wrote an article in which he and his co-authors defined three particular problems for which our inability to get outside of our own consciousness raises questions about whether we can ever attain accurate answers to the questions: one is the question about the nature of consciousness itself, one is about the history of the universe and the nature of time – we cannot get outside of the universe or outside of time in order to view it from an objective position – and one is about the nature of matter (Frank, *et al*). The article by Adam Frank (a professor of astrophysics at the University of Rochester in New York, USA), Marcelo Gleiser (a theoretical physicist at Dartmouth) and Evan Thompson (a professor of philosophy at the Peter Wall Institute for Advanced Studies at the University of British Columbia in Vancouver, Canada) is available online. You can use the QR code on the left to read it. The article deals with quite sophisticated ideas but is not loaded down with a mass of highly technical language and is pretty accessible to the layman.



How do we know
what is outside of our
own minds?



The problem discussed at the Dartmouth meeting is not a new one for science. An even bigger problem for the long-held idea that science will one day be able to give us a unified theory of everything, is the one which Gleiser and his co-authors point out in their article: we cannot get outside of our own consciousness in order to see whether what we perceive is an accurate representation of reality. They point out three big questions for which this is a problem, but if we think about it, we can see that it is actually a problem for all of science. We *observe* the behaviour of lizards in order to describe the life cycle of those lizards. We *observe* the process of photosynthesis in order to describe the process of photosynthesis. We *observe* the characteristics of light and sound in order to describe how light and sound work. Descartes and many other philosophers argued that those observations are perceived inside our minds, and we have no way to verify the precision of those perceptions relative to what happens in reality. An important underlying assumption of the natural sciences, then, is the belief that we can perceive accurately enough to be able to describe the world in useful ways. Our ability to subsequently predict and shape the world provides confirmation.

The problem of quantum physics and the fact that the act of observing atoms and particles alters their behaviour is by now a fairly well-known phenomenon. One famous example is the Schrödinger's Cat thought experiment in which physicist Erwin Schrödinger demonstrated a confounding idea about the nature of matter on the atomic scale, which is that tiny particles exist in two different forms at one time. However, we are not capable of observing that, so our observation of nature on the atomic scale changes the status of what we are observing. That failure in our abilities has to do with the nature of our consciousness and the limitations on our powers of observation. A good explanation of



the Schrödinger's Cat experiment and its implications for modern technology, such as the computer, can be found by viewing the TED-Ed video linked to via the QR code on the left.

With regards to the problem of direct observation in the natural sciences discussed above, even though we cannot double-check our perceptions directly, we can, and do know that our observations are accurate enough to be counted on. We know this because the predictions we make, using the knowledge we created using our observations, work. We know that our knowledge is sound because the inventions that have been developed using that knowledge function as we want them to. We know our scientific knowledge is accurate because we can successfully complete such projects as sending men to walk on the Moon, bringing them back home again, and broadcasting the event around the world using live television and radio – undertakings that depend absolutely on the accuracy of a vast body of scientific knowledge of many kinds.

Ideas about the limitations of our ability to know are the kind of ideas which are relevant to TOK, and they are also likely to be strange to students (and to teachers too!). The suggestion that the world we perceive is not the world as it is can also be disturbing and difficult to take in. You may find that your students, faced with the fact that much of our knowledge is not, and cannot be absolutely certain, may be inclined to slingshot to the belief that, if we cannot know everything then we cannot know anything, and that there is, therefore, no such thing as knowledge. It is very important that you work with your students to correct that kind of strongly dichotomous thinking. We absolutely do not want students to emerge from a two-year course in TOK thinking that there is really no such thing as knowledge!

Some teachers don't develop these deeply sceptical arguments in their classrooms though, and there is no suggestion that you should. They often do, however, arise naturally in the minds of the students, familiar as they are with movies like *Inception* (is it all just a dream?) or *The Matrix* (is it all just a virtual reality?) or *The Truman Show* (is it all just a reality TV show?). The key to guiding students through these discussions, however, is to return to the notion of experts working in communities of knowledge. You might explore the issue by asking, 'Given these deeply sceptical arguments, how do you think a scientist deals with it?' By transferring discussions to different AOKs you can unpack many different conclusions. It is also helpful to remind students that, while these are fun questions to ask, in practice we are quite happy to accept the belief that the external world is real and we demonstrate this belief in our everyday activities of stepping out of the way of moving traffic, taking medicine to cure diseases and taking exams in preparation for the 'real' world.

■ The importance of knowing that we *can* know

As you develop your course, you will want to ensure that you spend as much time and energy focusing on exploring the conditions under which we *do* know things, and why we can say that we know them, as you do on the conditions under which we *cannot* know things – or at least cannot know them at this time in history. There is always the possibility of knowing more later! One important tool in helping you to accomplish this goal will be the use of the course concepts. In particular, the concept of certainty can help you to demonstrate to students the idea that we do not need absolute certainty in order to be able to say that we know something, and that we can know quite a lot about something while still being open to revisions in our understanding of the details or nuances. Other concepts that can be used to help students understand the care that knowledge-makers take in developing and presenting their findings to the world are truth, objectivity, responsibility and values.

Two other important elements of the TOK course which should be used to help students focus on the strengths of our knowledge are the investigation into methods and the investigation into ethics in each of the different course parts. If students understand first and foremost the ethical demand for *accurate* knowledge – no matter what the context –



then they will also understand that the methods employed by responsible practitioners in each area (including individuals such as themselves!) exist because they are the methods best able to give us accuracy. Once they understand the methods, students will be better able to make determinations about whether the knowledge claims they encounter in the world are sound or not.

One academic subject with which TOK is commonly confused is Philosophy. Use the QR code in the margin to access an in-depth discussion of how the two subjects differ.

THE SHORT VERSION

The difficulty and the charge

Students sometimes find TOK presents a daunting prospect, because it demands that they abandon the facile assumption that what they are told is automatically true. The course requires that students develop a nuanced understanding of the relationship between process and product in the context of knowledge generation, and that their ability to judge the quality of the process will determine their ability to know which knowledge they can trust and which they cannot. The role of the teacher is to ensure that students don't, as a reaction to being faced with problems of making knowledge, resort to an entirely sceptical position and deny the existence of knowledge.

Part 3: Preparation for teaching Theory of Knowledge

Perhaps the biggest challenge for the new TOK teacher is the fact that the course content is wide-ranging enough that there is no college preparation for teaching TOK. The TOK teacher needs to know how knowledge is made in mathematics, the natural sciences, the human sciences, history and the arts. They have to know how individuals acquire their own personal knowledge, both in social contexts and in the formal areas of knowledge. The TOK teacher must also know how knowledge is made in at least two other contexts: religion, politics, technology, language or Indigenous cultures.

Some universities may offer a single course in the philosophy of a particular subject – the University of Oxford, for example, offers an online course in the philosophy of science – and those courses do provide some of the kind of insights needed for teaching TOK. The Oxford course, for instance, lists on the website topics such as the nature of the scientific method, the difference between science and non-science, and scientific realism as being central to the course (University of Oxford), but it puts those questions in the context of bigger questions of a philosophical nature. Few people complete, as part of their teacher preparation coursework, any course in the philosophy of their particular subject. Having a degree in, say, comparative literature and a teaching qualification to teach English does not require any overt study of what knowledge there is in literature and how it is attained. Having a degree in psychology and a licence to teach it in secondary school does not require any overt study of what it means to say that we have knowledge of human psychology and the degree to which we can consider that knowledge to be certain. Certainly, the college degree in our own subject is helpful, and certainly by attaining it one will have necessarily absorbed some understanding of these questions – in one's own subject area. But no one has degrees in at least eight of the eleven topics in the IB Theory of Knowledge curriculum.

That said, we have found that it is very helpful to begin your own TOK education by unpacking your own subject, simply because you do have some formal professional training in that subject and so will very likely have come across TOK issues in that context. Scientists are trained to take seriously any potential bias in the design, execution and interpretation of their experiments. Historians are intimately familiar with the need to identify and manage bias. Artists have considered carefully the connections between the purpose and communicative

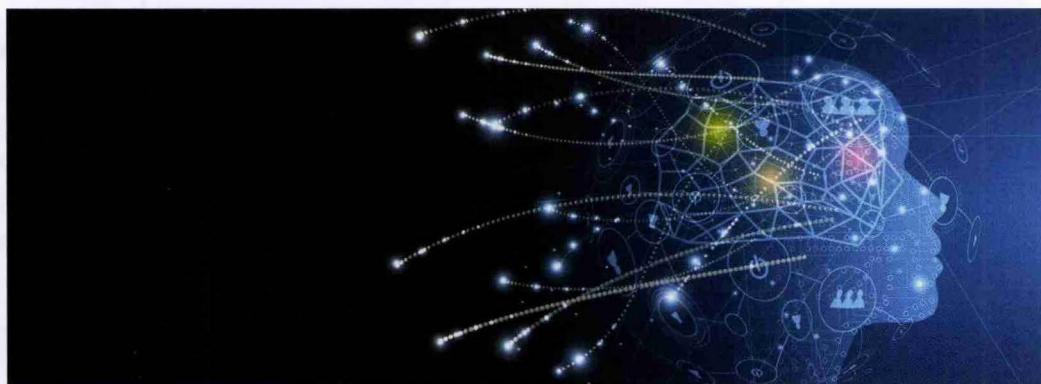
functions of art. Economists have already considered the role that models and various assumptions play in describing hugely complex social interactions. These sorts of questions might not form part of your teaching, but you will be sensitive to these types of TOK issues. Once you explore the structures provided by the TOK course to think through these issues, you will find that you are already sensitive to them. That's a great start.

Nevertheless, being appointed to teach TOK can be an intimidating experience. However, one can also look at the opportunity as just that: an opportunity. One of the fundamental IB aims is to promote lifelong learning and one of the real joys of teaching TOK is the fact that it provides a teacher with the chance to develop new understanding in a wide range of subjects – far beyond what most professional development training allows for.

This kind of learning takes time, of course, so there are two important points to be made here:

- First, there are resources to help ensure that you will be able to teach the course during the first couple of years while you develop your personal knowledge of the subject.
- Second, you will need to be patient with yourself when you are not as much of an expert on a particular subject as you would like to be. All teachers who dedicate themselves to developing their craft get better over time; teaching TOK is no different in this regard.

■ Where to start



■ RESOURCES

- ✓ Your most important resource is the **Theory of Knowledge subject guide**. If you have not yet read it thoroughly, then you should do so before continuing with this book. Keep the guide somewhere where you can access it easily – download it to your computer and/or bookmark it as a favourite in the programme resource centre (PRC). Your coordinator can give you access to the PRC if you do not already have it. The guide lays out for you everything that you are required to include in your course, and the aims and objectives you need to accomplish.
- ✓ In terms of preparing the content to teach, begin with the **core concepts and the four parts of the framework**. The framework gives you guidance about what it means to teach a theme or an area of knowledge. Each of those topics must be considered through the lenses of those four parts of the framework: Scope, Perspectives, Methods and tools and Ethics. The guide also provides you with knowledge questions that you might explore under each of those headings. You will see, as we go through each of the themes and areas of knowledge, that we have suggested how some of those knowledge questions might be answered and how they relate to the content in the student book.
- ✓ Another excellent source of help for many aspects of teaching the TOK course is the **teacher support material (TSM)**, also available on the PRC. Among other things, you will find some additional information about the role of the course concepts in the TSM. Chapter 1 of the student book is a resource chapter which contains detailed discussion of the meaning and significance for knowledge of each of the course concepts. Students should bookmark the beginning of the chapter and then return to it as needed throughout the course.

■ Begin your preparation with an examination of your own subject



The worksheet linked to by the QR code can be used to help you develop an understanding of the various themes and areas of knowledge. Begin with your own subject, the one in which you have developed the greatest expertise. Even if you haven't considered your subject in terms of these specific questions before, you likely know enough to answer most of these questions in detail; it will be more a matter of thinking about what you do know rather than learning a lot of new material. Once you have considered your own subject from the TOK perspective, you can move on to other subjects.

The questions on this worksheet have been developed to correlate with the four parts of the TOK curriculum framework – the four topics which must be considered in the context of each of the themes and areas of knowledge you study in your course. The questions on this document are more general than the specific knowledge questions that you will be asking your students to investigate. This exercise is intended to help you develop a general understanding of the particular topic. From there, you can work on more specific knowledge questions, such as those provided in the TOK subject guide.

We have also provided you with a model of a completed worksheet, which can also be accessed by using the QR code above. Rather than complete the model for one area of knowledge, we have answered some of the questions for each area of knowledge. This will give you an idea of how deeply to think about the questions, but will still require you to do much of your own thinking about your subject. The answer to the first question is shown below.

You will find that the responses in the model distill much longer discussions from the student book. Having students complete some or all of this worksheet at the end of each unit can be a very useful synthesis activity.

Note that none of the answers in the third column below are 'right' answers in the sense of being the only and definitive way to answer the question. Much more could be said in response to each question, so answers will differ from person to person. If students are completing some or all of the worksheet, they need to understand that they are presenting their personal understanding and that they need to convince their readers through accurate statements, sound reasoning and, where appropriate, documented evidence.

Area of knowledge worksheet

Question	Element of the knowledge framework	Area of knowledge
1	<i>Scope A: Aim of the endeavour</i> What is the aim of this area of knowledge? What do practitioners want to know? What does the practitioner of this area of knowledge aim to explain, describe, discover, develop or create? <i>Hint: This is a question about intent!</i>	History Historians want to know what happened in the past. (IB stipulates that an event must be more than 10 years old in order to qualify as history.) When we think of history, we generally mean the history of humankind, which means the history of humans' actions. Historians also want to know why people behaved as they did, how past events are related causally to each other and how that past has led to the present. All of the areas of knowledge and the topics of the optional themes also have a history: we can investigate the history of politics, say, or the history of language or the history of the natural sciences or art.

In order to educate yourself about the nature of the knowledge-generating processes in each of the themes and topics, you will need to seek out resources which are specifically about knowledge in that area, rather than resources which are intended to share knowledge from the subject area. So, for example, a standard high school history textbook is not likely to be as helpful a resource for you as something like EH Carr's *What is History?* That book, published in 1961, is a collection of a series of lectures that Historian Edward Hallett Carr gave at the University of Cambridge. The lectures are, as the title suggests, all about defining history as an epistemological endeavour. The works cited section in each of the chapters in this book will suggest some resources which you might find helpful in terms of learning how knowledge is generated, tested, validated and revised in each of the themes and areas of knowledge. The student book also references many sources which you may find useful for your own edification, or for use with students.

■ Organizing the course

One important decision that you will have to make is how to organize your course. There is no 'right' way to do this; you can choose whatever organizational structure makes sense to you.

In designing your course, you must begin with the practical consideration of how many hours are allotted and when during the students' two-year Diploma Programme. TOK courses are scheduled quite differently in different schools: many schools offer only the 100-hour minimum, while others have the course scheduled as a regular class for two years, just like an HL IB Diploma Programme course. Once you know the number of teaching hours you have available, you might want to first work out how many hours you need in order to complete the two assessments. The TOK subject guide provides some suggestions about this for teachers who have never taught the course before. Once you've allotted the time for the assessments, you will know how many hours you have for each of the required topics: the core theme, two of the optional topics, and the five areas of knowledge. Regardless of how you decide to organize your course, you should allow for an equal amount of time to be spent on each of those required topics.

The student book, of course, could only be organized one way, so we made a choice to organize it around the themes and areas of knowledge, with one chapter devoted to each. We have cautioned students, however, that the book may not be organized the same way their course is, and that they must, therefore, pay close attention to the teacher's instructions about which chapters to read when. The chapters are not dependent on each other, so students do not have to read them in a particular order.

The student book is organized as follows:

- Introduction
- Chapter 1 Course Concepts
- Core theme (one chapter):
 - Chapter 2 Core theme: Knowledge and the Knower
- Optional themes (five chapters):
 - Chapter 3 Knowledge and Technology
 - Chapter 4 Knowledge and Language
 - Chapter 5 Knowledge and Indigenous Societies
 - Chapter 6 Knowledge and Religion
 - Chapter 7 Knowledge and Politics

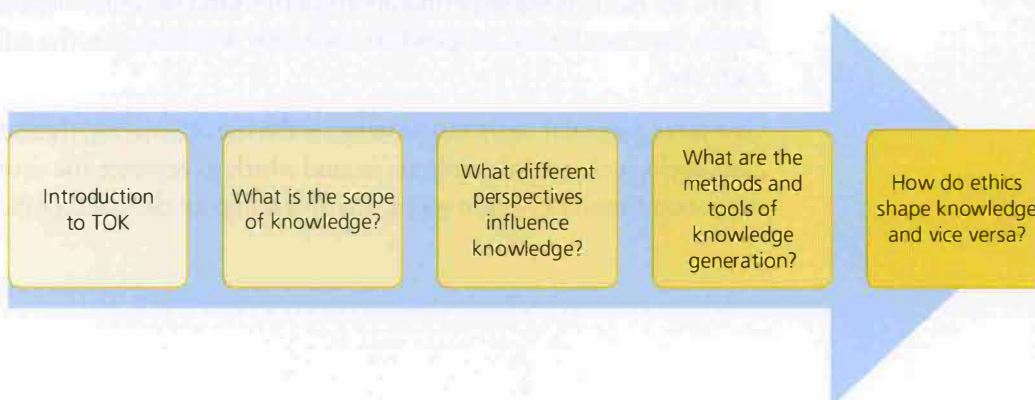
- Areas of knowledge (five chapters)
 - Chapter 8 Mathematics
 - Chapter 9 The Natural Sciences
 - Chapter 10 The Human Sciences
 - Chapter 11 History
 - Chapter 12 The Arts

The introduction is an overview of the Theory of Knowledge course, describing what students should expect to find in the course. The next chapter (Course Concepts) is a resource chapter, to which students will likely need to return many times during the course. This chapter discusses each of the 12 concepts in detail, including examples. In Chapter 2, we start the discussions of the main themes in the course, with the core theme: Knowledge and the Knower. With these elements firmly embedded we can then later develop them in the context of the optional themes and the areas of knowledge. There is also a resource chapter on ethics, titled 'Introduction to Ethical Theory', which is provided online for students who wish to pursue a more detailed study of ethics in general, outside the context of a particular theme or area of knowledge. This teacher guide also has an accompanying online resource on ethics, 'Introduction to Teaching Ethical Theory'; you can access it using the QR code. The chapter on ethics provides a background in ethics, including relevant technical terminology, so that students can read the discussion of ethics in each of the remaining chapters with a solid basis of understanding the issues which are involved in making knowledge about ethics.



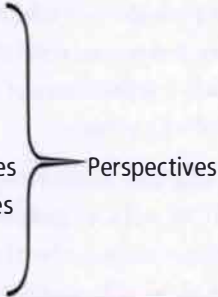
The optional themes and the areas of knowledge are organized similarly to how they are organized in the TOK subject guide. We have made some changes in order to exploit some connections among the themes, and so that the areas of knowledge are organized in terms of which areas can provide the most certainty to which areas can provide the least, but it is not critical that you read the chapters in the order in which they are presented. Note, too, that the question of which areas of knowledge generate more certainty than others is open for debate and can be considered by the students in your class. Even if you decide to organize your course around the themes and areas of knowledge, you do not have to feel constrained by the order of the chapters in the student book.

Another way to organize the course would be around the elements of the framework. You could choose to explore all the various themes and areas of knowledge in comparison and contrast to each other. Each of the four elements of the framework – Scope, Perspectives, Methods and tools and Ethics – could be approached as a separate unit in which the particular aspect of the framework is considered for all the themes and areas of knowledge in turn. Such a course might look something like this:



In such an organizational structure, students would not read the entire chapter on each theme or area of knowledge at once; instead, they would read the Scope sections, followed by the Perspectives sections in the next unit, followed by the Methods and tools sections, followed by the Ethics sections. You could, of course, arrange the framework topics in any order which suited you.

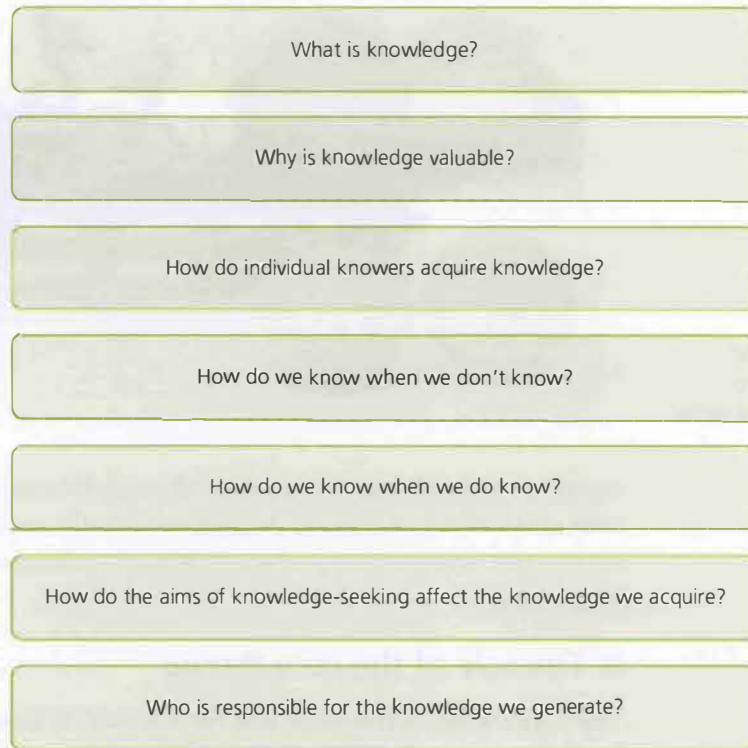
Another comparative approach would be to design the course around the teaching of the core concepts. In that design, each concept could be a unit, and you would determine an effective order in which to introduce and teach the concepts, and then, within each unit, you would include aspects of each theme and area of knowledge. You would have to track the development of the course to ensure that all of the themes and areas of knowledge were explored through the lens of each of the four aspects of the framework. One possible organizational structure for that design might look like this (note that for the purpose of developing this model, we chose technology and language as our optional themes):

Course plan organized by core concept		
Unit 1: Truth Core theme: Scope and Ethics Language: Ethics Technology: Ethics	Unit 2: Perspectives Core theme Technology Language Mathematics The Natural Sciences The Human Sciences History The Arts 	Unit 3: Objectivity and certainty Mathematics: Methods and Ethics The Human Sciences: Methods and Ethics Technology: Methods
Unit 4: Evidence, explanation, justification and interpretation Language: Methods The Natural Sciences: Methods and Ethics The Arts: Methods		
Unit 5: Culture and values Technology: Methods History: Scope, Methods and Ethics The Arts: Scope and Ethics	Unit 6: Power and responsibility Core theme: Methods Technology: Scope Language: Scope Mathematics: Scope The Natural Sciences: Scope	

There are many possible permutations of this kind of course organization, and you will decide how much time to spend on each unit depending on the amount of content in each one.

One more potential organizing strategy is the use of some big thematic questions. You can develop conceptual questions around which to organize the course and divide up the content similarly to the way it was divided up for the concept model. The internal

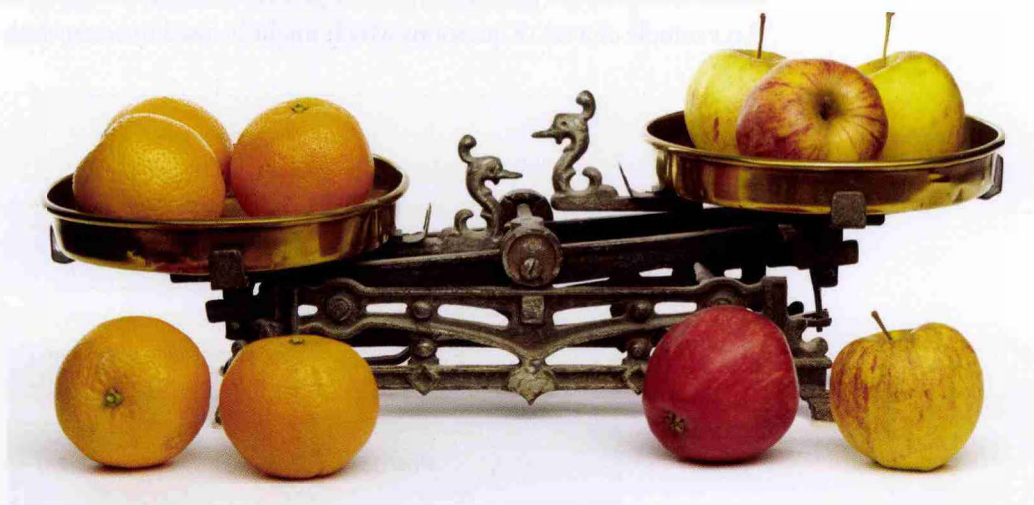
assessment prompts provided in the subject guide might be a good source of such questions. An example of a set of questions which might be used to create such a course is:



As with the concept-based organizational model, any number of sets of questions could be used as a basis for organizing your TOK course. These suggestions are examples only and other organizational structures are of course possible. The TOK subject guide and the TSM also have several examples of possible ways to organize the course. There is no reason that you should consider any of these different models as being 'better' than any other. A good course organization is one which allows you to include all of the requirements laid out in the guide, as well as to prepare your students for the two assessments.

One important consideration when you are choosing a design for your course is your personal comfort with the content of the themes and areas of knowledge. If you choose one of the inherently compare/contrast models, that will mean that you will have to feel comfortable that you understand several themes and areas of knowledge for each unit, right from the beginning of the course. If you are not comfortable with that at this point in your TOK teaching career, then perhaps organizing the course around one theme or area of knowledge at a time will allow you better opportunity to learn the content for yourself as you go along.

A final point to be made about the organization of your course is that the TOK essay is a compare/contrast task. Students will be required to respond to the question they choose with discussion of two different areas of knowledge. We have seen that the latter three of the sample organizational structures provided are inherently comparative, because you would be asking students to consider the framework element, concept or big question in the context of several themes and/or areas of knowledge together. If you choose an



Comparing and contrasting are important TOK skills

organizational structure which works through themes and areas of knowledge one at a time, you will have to ensure that you work in the compare/contrast aspect of the course deliberately. You can do this through lessons and through assessments internal to your programme.

■ The role of the core theme

The core theme, 'Knowledge and the Knower', is intended to help students explore both the way in which they personally make knowledge (or fail to do so!), and the way in which individual knowers in general do so. The purpose of the exploration is for students to identify the habits of mind which shape an individual's knowledge, so that once they understand the way those habits work in themselves (where they come from, how they shape knowledge and how they can block a person's ability to know) then they can recognize those forces at work in other people. For instance, students who have a good appreciation of the way that culture, preconceptions and the limitations of our physical senses both support and constrain our knowledge are better able to appreciate that other people with their differences may also be right (as stated in the IB mission statement). Because the topic of the individual knower and knowledge is called the 'core theme', it can be easy for students to develop an unacknowledged attitude that personal knowledge in general – and their knowledge in particular – is the most important element of the course. However, this is not the case. You will have to guard against any tendencies toward a narcissistic attachment to their own approaches to knowing and their own knowledge. The course is not intended to lead students to believe that whatever they think they know is good enough. In fact, all of us are wrong sometimes, and the ability to recognize when we are wrong and why is one of the skills that will help students thrive in the real world.

As with the course in general, you have many options for how you incorporate the core theme into your course. You may want to introduce the course with the core theme, or you may want to bookend the course with investigation into the core theme. You may want to introduce it and then revisit it in the context of the other topics, considering, for example, how individual knowers learn politics, language, mathematics, arts and so on. You may want to end the course with the core theme. Or you may want to combine some of these. It is important to remember, however, that in terms of time, the core theme constitutes one eighth of the course, just as each of the optional themes and the areas of knowledge do.

■ Comments about assessment

One reason that it will be important for you to allot equal time to each of the themes and areas of knowledge is that the two assessments are divided among them. The TOK subject guide suggests that the internal assessment (the exhibition), will be completed based on work done in the core and optional themes. The prescribed titles for the essay will require students to write about the areas of knowledge. The last chapter of this book will provide you with specific advice about how to prepare students for the two assessments. There is also a student skills book, *Theory of Knowledge for the IB Diploma: Skills for Success 2nd edition*, by John Sprague, published by Hodder Education, which gives students advice on how to prepare for their assessments.

■ Working with other IB teachers

A final responsibility you may find that you have as your school's TOK teacher is to work with the subject area teachers in order to help them incorporate relevant elements of TOK into their courses, as required by the IB. Some important points you can help your subject area colleagues understand are shown below.

- It is not the job of the subject teachers to teach TOK or to prepare students for their TOK assessments.
- The inclusion of TOK elements in the subject areas is intended to help students understand the subject areas better.
- Subject teachers are almost certainly already asking students to do some TOK thinking in their courses without realizing that they are doing so. Finding where this is already happening might be a good way to ease subject teachers into an awareness of what we do in TOK and a willingness to support our efforts.

Theory of Knowledge is one of the three elements of the Diploma Core. The other two are the extended essay and creativity, activity, service (CAS). These three elements are central to the Diploma experience because they should help students to do a better job of learning in all of their Diploma subjects. The three specific aims of the DP core, as presented in the TOK subject guide, are shown below:

Aims of the DP core

The three elements of the DP core are intended to complement each other and to work together to achieve three common aims. These are:

- to foster international-mindedness and encourage students to become responsible and actively involved global citizens
 - to develop students' self-awareness and sense of identity, and provide an opportunity for reflection on their development of the attributes of the IB learner profile
 - to enrich and add value to students' overall learning experiences through the core – supporting, and being supported by, their academic studies in the rest of the programme.
-

(TOK subject guide, page 4)

All three of these aims reflect the IB mission statement and are completely consistent with the aims of the subject areas, so the effort to incorporate TOK is not an additional responsibility for subject teachers.

■ RESOURCES

- ✓ One resource that can be very useful is the worksheet discussed on page 23. Subject teachers can complete some or all of the questions for their own subject areas. This exercise will help them think about their own subjects in terms of how knowledge is constructed. Many teachers will not have been asked to think this way before. Once they have completed the worksheet, the subject teachers will have a nice resource to pull from at appropriate moments during their curricula to help students think about their subjects from a TOK perspective. If they share their responses with you, you will have a helpful resource too, to help you learn more about how knowledge is made in the different subject areas.
- ✓ There are a number of excellent resources from the IB for working with TOK in the subject areas. There is a Category 3 workshop called TOK for Subject Teachers which is extremely helpful and will provide you with many resources as well as teaching ideas for the subject teachers. Ideally, some of your school's subject teachers can go and bring ideas back for their departments, but if not, someone in your school who will be instrumental in coordinating the work with subject teachers (IB coordinator, core coordinator, TOK coordinator or you!) can go and bring the ideas back to your school. There are also a good many helpful resources on the PRC, including videos about concept-based teaching, inquiry-based teaching, TOK and psychology and a video on understanding knowledge questions. The easiest way to locate those videos is to log in to the PRC and type 'video' into the search bar. Once you locate the videos you want, be sure to click on the 'add to my resources' button at the top of each of the individual pages so that you can find them easily later.
- ✓ One final resource is the set of 'Works cited' pages in this teacher book and in the student book. Each chapter has its own works cited list, and many of the articles referred to could be used both for your own edification and as a means of having students explain the exploration of the concepts in the particular chapter you have assigned. One thing to keep in mind, however, is that few, if any, of the articles, websites and books are themselves written to support the TOK course. Their use in the student book, then, can serve as model for 'finding TOK in the wild'.

Conclusion

As you can see, teaching TOK is a complicated effort but is hugely rewarding. If this is your first time with the course, do your best, but do not hold yourself to unrealistic standards. Rely on your resources, ask for help from other TOK teachers and commit yourself to learning as you go. If you are doing that, you are doing a good job and you will get better at teaching the course as you become more experienced. Teaching TOK offers you a fabulous opportunity to grow intellectually and to engage students in a kind of question that they do not get to explore very often in school. TOK is a course that many students report, in retrospect, was the most valuable one they had in high school. Enjoy being part of it!

How to use this book

The remaining chapters in this book align to the chapters in the student book. Chapter 1 of the student book is a reference chapter, and you will find some additional advice in this book, but the student book probably contains most of the information you will need as you work through the course.

Chapters 2–12 are organized, as the student book is, by the elements of the framework in the guide. Within that structure we have suggested some knowledge questions, usually from the subject guide, but occasionally additional questions, that could be used as you explore that aspect of the framework. We have provided a detailed example of how one of those questions might be explored, and we have provided some suggested activities – in

addition to those which are included in the student book. Each chapter contains one fully developed lesson plan, again, as a model for how lessons might be developed. We have also provided some ideas about how the content of that theme or area of knowledge might be connected to the core theme – Knowledge and the Knower.

As we noted earlier, there are many ways to organize the course. We could organize the book in only one way, so we chose to organize it based on the themes and the areas of knowledge. This organization might create an unintended impression that the themes and the areas of knowledge all occupy particular niches in the course and in the world, but such an idea is overly simplified. In fact, as you will see (even in the student book) the different topics in the TOK course often overlap each other. When it comes to working with real-life situations, you will very often find that more than one theme or AOK is relevant to the knowledge-making in that situation. Knowledge generation in the real world is a complex process which does not take place in isolated situations, and exploring these processes will help students to develop a more sophisticated understanding of knowledge in their lives and in the world at large than considering the various themes and topics in isolation would do. When it comes to writing the TOK essay, furthermore, students will have to be able to compare and contrast two different areas of knowledge, so during the course they need to develop experience in considering how the different areas of knowledge are similar and different in terms of their knowledge-generating processes and implications. In this book, therefore, we have also made some suggestions about connections that might be made between the theme or area of knowledge in that chapter and other themes or areas of knowledge.

One final important point that we need to make is that none of the chapters – either in this book or in the student book – covers all the possible concepts, knowledge questions, answers to knowledge questions or connections to other parts of the course that could be covered for any of the themes or areas of knowledge. Nor are the topics which were chosen for inclusion the only possible topics which could be investigated in a TOK course in order to fulfil the aims and objectives. The possibilities of what to investigate are almost endless, and the particular points that you raise with your students will necessarily depend on the choices you make about which optional topics to include, the resources available to you for use in class, your expertise in particular areas and your personal preference. Our aim, therefore, is not to provide you with the definitive model for teaching the course; rather, our aim is to demonstrate a number of different ideas and approaches that you might use in the teaching of the required topics and themes as described in the guide, and then to encourage your creativity in designing your own lessons to replace or augment what you find here.

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